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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,970	10/31/2005	Mohammed Zourob	41577/314451	6276

23370 7590 02/26/2008  
JOHN S. PRATT, ESQ  
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ATLANTA, GA 30309

EXAMINER
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CONNELLY CUSHWA, MICHELLE R

ART UNIT	PAPER NUMBER
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2874

MAIL DATE	DELIVERY MODE
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02/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,970	<b>Applicant(s)</b> ZOUROB ET AL.	
	<b>Examiner</b> MICHELLE R. CONNELLY CUSHWA	<b>Art Unit</b> 2874	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's Amendment filed November 15, 2007 has been fully considered and entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 2 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al. (US 6,483,959 B1).**

Regarding claims 1, 5, 6; Singh et al. (US 6,483,959 B1) discloses a waveguide structure (see Figure 24 and column 20, lines 1-21) comprising a sensing layer (31) of a medium disposed upon a second layer (32 having  $n=2.0$ , 33 having  $n=1.47$ ), the second layer being disposed upon a third layer (35 having  $n=1.72$ ) of refractive index higher than that of a refractive index of the second layer, in which the structure is capable of supporting a bulk optical mode in the second layer (32, 33; see the abstract), the medium being adapted to trap a target particle that results in a change in a optical property of the sensing layer (see the abstract) and the thickness and/or refractive index of the second layer is selected to control the depth of penetration of the optical mode into the sensing layer and to overlap at least a major portion of the particle.

Singh et al. does not explicitly teach that the refractive index of the second layer may be within the range of 1.33 to 1.45 or that the thickness of the second layer is in the range of 300-500 nm. However, Singh et al. does state that it will be understood that the materials and thicknesses given are only examples as other materials and appropriate thicknesses may be used to construct a waveguide in accordance with the disclosed invention (see column 25, lines 34-37). Thus, given this teaching of Singh et al., one of ordinary skill in the art would have been motivated to consider other materials for forming the invention of Singh et al. while maintaining the required relationships between respective refractive indices of the layers. Materials commonly used to form waveguides and having refractive indices in the range of 1.33 to 1.45, including silica, are well known in the art. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second layer with a refractive index of 1.33-1.45, including silica, and a thickness of 300-500 nm, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice (*In re Leshin*, 125 USPQ 416), that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233), and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)), and since Singh et al. suggests the use of other known materials.

Regarding claims 2, 7; a highly reflective fourth layer (34, metal) is included between the second layer (32, 33) and a third layer (35).

Regarding claim 8; Singh et al. discloses the use of chromium, zirconium, tantalum or titanium as a metal layer.

Regarding claim 9; see column 3, lines 20-39.

Regarding claim 10; see column 2, line 51, through column 3, line 10.

Regarding claim 11; Singh et al. discloses that the particle may chemical and/or biological particles (see the abstract), however, Singh et al. does not explicitly state that the particles ranges in diameter from 1-10 micrometers. One of ordinary skill in the art would have found it obvious to us the device of Singh et al. to detect any desired chemical or biological particle by providing the appropriate receptors in the sensing layer, including bacterium ranging from 1 to 10 micrometers.

Regarding claim 12; One of ordinary skill in the art would have found it obvious to use an optical source with a wavelength of 488 nm or 635 nm, since optical sources having these wavelengths are well known, commonly used and readily available in the art.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 2 and 5-12 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

/Michelle R. Connelly-Cushwa/  
Patent Examiner  
February 19, 2008